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Case Reports

Malignant struma ovarii with synchronous papillary thyroid carcinoma: a rare diagnosis

S. Proença, M. Mouraz, P. Conde, H. Santos e Pereira, F. Nunes

Department of Gynecology and Obstetrics, Hospital de Cascais Dr. José de Almeida, Cascais (Portugal)

Summary

Struma ovarii is a rare form of ovarian tumor, represented in more than 50% by thyroid tissue. Malignant transformation is a rare presentation and comprises about 5% of cases. The authors report a female with papillary thyroid carcinoma arising in struma ovarii, diagnosed after surgery for a right ovarian mass. Thyroid examination showed two nodular lesions in the left lobe. Total thyroidectomy was performed and histology showed a papillary carcinoma, discordant in terms of ovarian tissue, synchronous to the ovary. Radioiodine ablation of residual thyroid tissue was performed and levothyroxine mildly-suppressive treatment was begun. Although the rareness of association, it is of extreme importance that patients with malignant struma ovarii undergo imaging of thyroid gland for study of coexistent disease.

Key words: Ovarian neoplasm; Struma ovarii; Thyroid neoplasm; Ovarian teratoma.

Introduction

Mature cystic teratomas account for approximately 20% of all ovarian tumors. Struma ovarii is a specialized teratoma predominantly composed of mature thyroid tissue and constitutes about 5% of all ovarian teratomas. It is usually a benign condition, although malignant transformation may occur in 1-5% [1, 2]. Metastases are uncommon and the prognosis is good with a five-year-survival rate of 92% [3, 4]. Most of the cases are incidental findings, others may present as a symptomatic pelvic mass, lower abdominal pain or clinical hyperthyroidism [4, 5]. There are some reports of thyroid disease associated with these tumors including thyrotoxicosis, Hashimoto's disease, Grave's disease, goiter, and toxic adenoma [1, 6-8]. Due to the rarity of the disease, lack of uniform histological criteria for malignancy and clinical course, its management is not universally clear.

The present authors present a rare case of malignant struma ovarii with an incidental synchronous association to primary papillary thyroid carcinoma. To their knowledge, this coexistence has only been described in literature in five other case reports [4, 7, 9, 10].

Case Report

A 35-year-old woman presented to the gynecologist with dysmenorrhea. Gynecological anamnesis reported menarche at the age of 13 years, regular menstrual cycles, one parturition, and one abortion. She was under oral contraceptives and her past medical history revealed a surgery for a benign breast tumor. The patient had no history of thyroid disfunction and no family history of ovarian or endocrine tumors. She had no signs or symptoms of hyperthyroidism. Physical examination revealed a right-sided pelvic mass. Transvaginal ultrasound showed a 75-mm heterogeneous right ovarian mass, thick-walled, septated cysts, with solid component of 41×32 mm in diameter. Malignancy could not be excluded. To better define diagnosis, MRI was performed and confirmed a right heterogeneous pelvic mass of 59×60×50 mm diameter with solid and cystic components, suggestive of an ovarian teratoma. Hormonal profiles were normal and tumor markers (CA 125) negative. The patient underwent a laparoscopy with right unilateral salpingo-oophorectomy. Intraoperatively the right ovary presented as a seven-cm pelvic multiloculated mass. Histopathologic examination revealed a 6.5×5-cm ovarian neoplasm composed of mixed elements arising from germ layers with predominance of thyroid parenchyma with benign thyroid follicles and predominantly malignant papillary architecture within thyroid follicles. Final diagnosis was follicular variant of papillary thyroid carcinoma harbored in struma ovarii. There was no evidence of lymphovascular or tumor invasion through the ovarian cortex. After surgery, functional examination of thyroid gland revealed serum thyroglobulin levels and thyroid stimulating hormone (TSH) in the normal range. Thyroid ultrasonography showed two micronodules of two and three mm well-circumscribed on the left lobe and one micronodule of three mm on right thyroid lobe. Total thyroidectomy followed by radioiodine therapy (^{131}I) was performed. Histology revealed a 2.3-mm left, unifocal, papillary carcinoma with no extra thyroid extension and no lymph node metastases. Based on the American Joint Committee on Cancer seventh edition thyroid cancer staging, the present patient disease was classified as pT1aN0. The ablation of residual thyroid tissue was performed on a dose of 70 milliCuries (mCi) of ^{131}I. Whole body scan with single photon emission CT/TC 48 hours after ^{131}I ablation demonstrated thyroid remnant uptake and no disease in the neck or distant functioning metastases. After therapy, the pa-

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Table 1. — *Literature Review and Clinical Presentation of Malignant struma ovarii with synchronous papillary thyroid carcinoma.*

Reference	Presentation	Imaging	Pelvic Surgery	TT	RAI	Histology	Follow-up
Marti et al. [9]	44y. Palpable adnexal mass on routine exam. Normal TF	US two right ovarian cysts, 2,4 and 1,4cm US 5mm right thyroid nodule with calcifications	BSO, TAH, omentectomy, pelvic and para-aortic lymph node dissection	Yes	Yes	PTC in struma ovarii 5cm Thyroid PTC 5mm with ETE (T3N1a)	NED at 0,75y
Janszen et al. [12]	52y. Asymptomatic.	US 10 cm heterogeneous cyst in the left ovary	BSO	Yes	Yes	FTC in struma ovarii Thyroid PTC 3mm	NED at 2y
Brusca et al. [4]	30y. Abdominal pain, palpable abdominal mass. Normal TF	CT right ovarian mass 10x6cm US 23mm nodular in the lesion left thyroid lobe	USO peritoneal biopsies	Yes	Yes	FTC in struma ovarii 9mm Thyroid PTC 2mm	NED at 0,5y
Leong A. et al. [3]	42y. Syntomatic pelvic mass. Normal TF	US 13,5cm pelvic mass U/S 1cm nodule in the left thyroid lobe	TAH, BSO	Yes	Yes	PTC in struma ovarii	NED at 1y
Krishnammurthy A. et al. [13]	51y. Palpable pelvic mass. Normal TF	CT 13x7cm heterodense adnexal mass US 4mm nodule in the right thyroid lobe	TAH, BSO, omemtectomy, lymph nodes and peritoneal biopsies	Yes	Yes	FTC in struma ovarii 8mm Thyroid FTC	NED at 0,5y
Proença et al.	35y. Dysmenorrhea. Normal TF	US and MRI: heterogeneous pelvic mass of 59x60x50mm US: 2mm micronodules in left and 3mm right thyroid lobe	USO	Yes	Yes	FTC in struma ovarii 6cm Thyroid PTC	NED at 0,75y

y - years; TAH - Total Abdominal Hysterectomy; USO - unilateral salpingo-oophorectomy; BSO - bilateral salpingo-oophorectomy; TT - Total Thyroidectomy; RAI - Radioiodine Ablation; PTC - papillary thyroid carcinoma; ETE - extrathyroid disease extension; FTC - follicular thyroid carcinoma; NED - no evidence of disease; US - ultrasonography; CT - computed tomography; MRI - magnetic resonance imaging; TF - Thyroid Function.

tient was maintained on thyroid hormone suppression with levothyroxine. Nine months after surgery, the patient underwent thyroglobulin evaluation and neck ultrasonography, which showed no evidence of recurrence, and maintains follow-up for both malignant struma ovarii and thyroid carcinoma.

Discussion

Struma ovarii is a rare monodermal ovarian teratoma containing more than 50% of thyroid tissue. Malignant transformation occurs in 1-5% of patients, generally postmenopausal in the fifth or sixth decades of life [4, 9, 11]. Approximately 94% of the tumors are unilateral and appear to involve the left ovary more commonly than the right one [4, 7, 8].

Patients often present with pelvic pain or irregular menstrual bleedings whereas a minority (5-10%) have symptoms consistent with hyperthyroidism [5, 12]. Elevated CA125 and ascites may rarely be present, associated to Pseudo-Meigs Syndrome [6]. Preoperative diagnosis is complicated by a lack of specificity of MRI, CT, and ultrasonography. Transvaginal ultrasound may reveal a cyst, often with septae or solid areas that may mimic an endometrial or dermoid cyst, making it difficult to distinguish from ovarian teratoma. Metastases are uncommon, reports differ from 5-23% [4, 5, 9], and involve the liver, brain, lung, bone, and contralateral ovary. Criteria for malignancy is similar to those for thyroid papillary and follicular carcinoma including overlapping ground glass nuclei in the former and vascular space invasion and capsular penetration in the latter. Teratomatous or strumal elements must be present in order to consider malignancy in struma ovarii. Otherwise, a diagnosis of ovarian metastasis from a primary thyroid carcinoma should be considered. As in the thyroid, papillary carcinoma is the most common malignant histotype [8, 13].

Although surgery is needed for diagnosis, surgical staging and definitive treatment, optimal management remains undefined. As there are no randomized controlled studies, management is based on published case reports and case series. Different pelvic surgery approaches have been used and documented by different groups such as unilateral cystetomy, unilateral salpingo-oophorectomy or total abdominal hysterectomy with bilateral salpingo-oophorectomy. Surgical therapy may differ upon age: for women of childbearing age, it may be sufficient to preserve uterus and contra lateral ovary if they appear to be normal unlike women who have completed childbearing in which total abdominal hysterectomy and bilateral salpingo-oophorectomy should be performed. For patients without metastases and with small tumors, pelvic surgery may be sufficient [4, 9]. Thyroid treatment is needed with thyroidectomy followed by radioactive iodine ablation in cases of extraovarian disease or distant metastases. After ^{131}I ablation any detectable serum thyroglobulin points to persistent or recurrent disease. After ablation, the highly sensitive post-ablation total body scan can demonstrate completeness of surgical exci-

sion or indicate metastatic disease. As in thyroid carcinoma, long-term surveillance (10-20 years) is required, with serum thyroglobulin monitoring and ^{131}I scan. Although with unpredictable biological behaviour, clinical course of malignant struma ovarii appears to be protracted with a majority of patients having long term survival [7, 14].

The present patient was thought initially to have an ovarian teratoma. Thyroid function tests were normal and, as a young female with a six-cm ovarian tumor, a conservative surgical approach was performed. Regardless of the initial diameter, the disease was confined to ovary. With the association of malignant struma ovarii and a nodular thyroid lesion upon neck, ultrasound followed by thyroidectomy was performed and revealed the coexisting primary thyroid carcinoma.

Because systematic reviews of thyroidectomy specimens in patients with malignant struma ovarii have not been performed, the percentage of patients with coexisting primary thyroid carcinoma is unknown. To the present authors' knowledge, only five cases of synchronous malignant struma ovarii and primary thyroid carcinoma have been reported (Table 1). Since histology in the thyroid and ovary differed, the struma ovarii was considered a primary tumor and not a metastasis.

Conclusion

Malignant struma ovarii is a rare gynecological endocrine-oncological disorder. Due to its rarity there is little information about the natural course of this disorder after surgical resection and the best postoperative treatment modalities. If one suspects struma ovarii, serum levels of free T4, thyroglobulin, and TSH should be measured. Once the diagnosis of malignant struma ovarii has been made, thyroid evaluation should be completed with ultrasound to exclude a synchronous thyroid malignancy.

References

[1] Zekri J.M., Manifold I.H., Wadsley J.C.: "Metastatic struma ovarii: late presentation, unusual features and multiple radioactive iodine treatments". *Clin. Oncol. (R. Coll. Radiol.)*, 2006, *18*, 768.

[2] O'Neill J.P., Burns P. Kinsella J.: "Papillary type thyroid carcinoma in an ovarian struma". *J. Reprod. Med.*, 2002, *47*, 943.

[3] Yassa L., Sadow P., Marqusee E.: "Malignant struma ovarii". *Nat. Clin. Pract. Endocrinol. Metab.*, 2008, *4*, 469.

[4] Brusca N., Del Duca S.C., Salvatori R., D'Agostini A., Cannas P., Santaguida M.G., *et al.*: "A case report of thyroid carcinoma confined to ovary and concurrently occult in the tyroid:is conservative treatment always advised?" *Int. J. Endocrinol. Metab.*, 2015, *13*, e18220.

[5] Makani S., Kim W., Gaba A.R.: "Struma ovarii with a focus of papilarry thyroid cancer: a case report and review of the literature". *Gynecol. Oncol.*, 2004, *94*, 835.

[6] Zannoni G.F., Gallota V., Legge F., Tarquini E., Scambia G., Ferrandina G.: "Pseudo-Meigs' Syndrome associated with malignant struma ovarii: a case report". *Gynecol. Oncol.*, 2004, *94*, 226.

[7] Navarro M.D., Tan M.A.L., Lovecchio J.L., Hadju S.I.: "Case report: malignant struma ovarii". *Ann. Clin. Lab. Sci.*, 2004, *34*, 107.

[8] Hatami M., Breining D., Owers R.L., Del Priore G., Goldberg G.L.: "Malignant struma ovarii - a case report and review of literature". *Gynecol. Obstet. Invest.*, 2008, *65*, 104.

[9] Marti J.L, Clark V.E., Harper H., Chhieng D.C., Sosa J.A., Roman S.A.: "Optimal surgical management of well-differentiated thyroid cancer arising in struma ovarii: a series of 4 patients and a review of 53 reported cases". *Thyroid*, 2012, *22*, 400.

[10] Leong A., Roche P.J., Paliouras M., Rochon L. Trifiro M., Tamilia M.: "Coexistence of malignant struma ovarii and cervical papillary thyroid carcinoma". *J. Clin. Endocrinol. Metab.*, 2013, *98*, 4599.

[11] O'Neill J.P., Burns P., Kinsella J.: "Papillary type thyroid carcinoma in an struma ovarii". *Ir. J. Med. Sci.*, 2012, *181*, 115.

[12] Janszen E.W., Van Doorn H.C., Ewing P.C., de Krijger R.R., de Wilt J.H., Kam B.L., de Herder W.W.: "Malignant struma ovarii". *Ned. Tijdschr. Geneeskd.*, 2008, *152*, 1647.

[13] Krishnammurthy A., Ramshankar V., Vaidyalingam V., Majhi U.: "Synchronous papillary carcinoma thyroid with malignant struma ovarii: A management dilemma". *Indian J. Nucl. Med.*, 2013, *28*, 243.

[14] Barrera J.R., Manalo L.A., Ang F.L.L.: "Papillary thyroid-type carcinoma arising from struma ovarii". *BMJ Case Rep.*, 2012, *2012*, pii: bcr0320126145.

Corresponding Author:
S. PROENÇA, M.D.
Avenida da Ilha da Madeira n. 26
3º esquerdo 1400-204 Lisbon (Portugal)
e-mail: saritaproenca@gmail.com